

CLAIMS

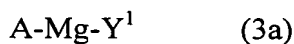
1. A process for production of an aromatic compound represented by formula (1) below:



wherein, R is an optionally substituted hydrocarbon group or a C₃ - C₁₀ saturated or unsaturated ring group, which ring may optionally be intervened by an oxygen atom or a group represented by formula -N(B)- (wherein B is a hydrogen atom, an optionally substituted C₁ - C₁₀ hydrocarbon group or an optionally substituted C₁ - C₁₀ alkoxycarbonyl group) and may optionally be substituted; and A is an optionally substituted C₄ - C₂₀ aromatic group or an optionally substituted heteroaromatic group, which comprises reacting a compound represented by formula (2) below:



wherein, R has the same significance as defined above, and X is a halogen atom or a sulfonic acid ester, with an aromatic magnesium reagent represented by formula (3a) below:



wherein A has the same significance as defined above and Y¹ is bromine, iodine, chlorine or a carbanion ligand, in the presence of an iron catalyst and a diamine compound.

2. The process for production of an aromatic compound according to claim 1, wherein the iron catalyst is an iron salt or an iron complex.

3. The process for production of an aromatic compound according to claim 1 or 2, wherein the diamine compound is a bidentate ligand.

4. The process for production of an aromatic compound according to any one of claims 1 to 3, wherein R is an optionally substituted primary alkyl group or an optionally substituted secondary alkyl group.

5. The process for production of an aromatic compound according to any one of claims 1 to 4, wherein A is an optionally substituted C₄ - C₂₀ aryl group.

6. A process for production of an aromatic compound represented by formula (1) below:



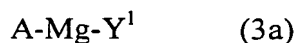
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wherein, R is an optionally substituted hydrocarbon group or a C₃ - C₁₀ saturated or unsaturated ring group, which ring may optionally be intervened by an oxygen atom or a group represented by formula -N(B)- (wherein B is a hydrogen atom, an optionally substituted C₁ - C₁₀ hydrocarbon group or an optionally substituted C₁ - C₁₀ alkoxy carbonyl group) and may optionally be substituted; and A is an optionally substituted C₄ - C₂₀ aromatic group or an optionally substituted heteroaromatic group, which comprises:

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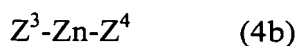
a step of reacting an aromatic magnesium reagent represented by formula (3a) below:

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wherein A has the same significance as defined above and Y¹ is bromine, iodine, chlorine or a carbanion ligand, with a zinc compound represented by formula (4b) below:

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wherein each of Z³ and Z⁴, which may be the same or different, independently represents bromine, iodine, chlorine, fluorine or a trifluoromethanesulfonyl group, in the presence of a diamine compound to give the reaction mixture; and

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a step of reacting the reaction mixture with a compound represented by formula (2) below:

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wherein R has the same significance as defined above and X is a halogen atom or a sulfonic acid ester, in the presence of an iron catalyst.

7. The process for production of an aromatic compound according to claim 6, wherein the iron catalyst is an iron salt or an iron complex.

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8. The process for production of an aromatic compound according to claim 6 or 7, wherein the diamine compound is a bidentate ligand.

9. The process for production of an aromatic compound according to any one of claims 6 to 8, wherein R is an optionally substituted primary alkyl group or an optionally substituted secondary alkyl group.

10. The process for production of an aromatic compound according to any one of claims 6 to 9, wherein A is an optionally substituted C₄ - C₂₀ aryl group.

11. A process for production of an aromatic compound represented by formula (1) below:



wherein, R is an optionally substituted hydrocarbon group or a C₃ - C₁₀ saturated or unsaturated ring group, which ring may optionally be intervened by an oxygen atom or a group represented by formula -N(B)- (wherein B is a hydrogen atom, an optionally substituted C₁ - C₁₀ hydrocarbon group or an optionally substituted C₁ - C₁₀ alkoxy carbonyl group) and may optionally be substituted; and A is an optionally substituted C₄ - C₂₀ aromatic group or an optionally substituted heteroaromatic group, which comprises:

a step of reacting an aromatic lithium reagent represented by formula (3c) below:



wherein A has the same significance as defined above, with a zinc compound represented by formula (4b) below:



wherein each of Z³ and Z⁴, which may be the same or different, independently represents bromine, iodine or chlorine, in the presence of a diamine compound and then reacting with a Lewis acid metal compound containing at least one metal selected from magnesium, titanium, zirconium, hafnium, gallium and aluminum to give the reaction mixture, and

a step of reacting the reaction mixture with a compound represented by

formula (2) below:



5 wherein R has the same significance as defined above and X is a halogen atom or a sulfonic acid ester, in the presence of an iron catalyst.

12. The process for production of an aromatic compound according to claim 11, wherein the iron catalyst is an iron salt or an iron complex.

13. The process for production of an aromatic compound according to
10 claim 11 or 12, wherein the diamine compound is a bidentate ligand.

14. The process for production of an aromatic compound according to any one of claims 11 to 13, wherein R is an optionally substituted primary alkyl group or an optionally substituted secondary alkyl group.

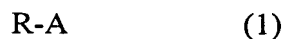
15. The process for production of an aromatic compound according to any
15 one of claims 11 to 14, wherein A is an optionally substituted C₄ - C₂₀ aryl group.

16. The process for production of an aromatic compound according to any one of claims 11 to 15, wherein the Lewis acid metal compound is a metal compound represented by formula (4c) below:



wherein M is magnesium, titanium, zirconium, hafnium, gallium or aluminum; each of Z¹, which may be the same or different, independently represents bromine, iodine, chlorine or a carbanion ligand; and n is an integer of 2 to 4.

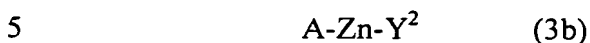
25 17. A process for production of an aromatic compound represented by formula (1) below:



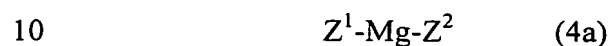
30 wherein, R is an optionally substituted hydrocarbon group or a C₃ - C₁₀ saturated or unsaturated ring group, which ring may optionally be intervened by an oxygen atom or a group represented by formula -N(B)- (wherein B is a hydrogen atom, an optionally substituted C₁ - C₁₀ hydrocarbon group or an optionally substituted C₁ - C₁₀ alkoxycarbonyl group) and may optionally be substituted; and A is an optionally
35 substituted C₄ - C₂₀ aromatic group or an optionally substituted heteroaromatic

group, which comprises:

a step of reacting an aromatic zinc reagent represented by formula (3b) below:

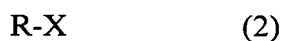


wherein A has the same significance as defined above and Y^2 is bromine, iodine or chlorine, with a magnesium compound represented by formula (4a) below:



wherein Z^1 is a carbanion ligand and Z^2 is bromine, iodine or chlorine, in the presence of a diamine compound to give the reaction mixture; and

a step of reacting the reaction mixture with a compound represented by
15 formula (2) below:



wherein R has the same significance as defined above and X is a halogen atom or a
20 sulfonic acid ester, in the presence of an iron catalyst.

18. The process for production of an aromatic compound according to claim 17, wherein the iron catalyst is an iron salt or an iron complex.

19. The process for production of an aromatic compound according to claim 17 or 18, wherein the diamine compound is a bidentate ligand.

25 20. The process for production of an aromatic compound according to any one of claims 17 to 19, wherein R is an optionally substituted primary alkyl group or an optionally substituted secondary alkyl group.

21. The process for production of an aromatic compound according to any one of claims 17 to 20, wherein A is an optionally substituted $\text{C}_4 - \text{C}_{20}$ aryl group.